



Custom Programming

Perivascular Flowprobes

For Graft Materials & Other Conditions

Some research applications (ventricular assist device implants, or bench flow testing) require perivascular probes that will measure through an artificial vessel. Trasonic perivascular probes are normally calibrated, normalized and programmed for use on native tissue vessel to measure blood flow at body temperature. Using these probes on artificial graft materials or tubing can affect the performance of the flowprobe by attenuating the acoustic signal. Calibration for absolute accuracy may also be affected.

The following services can be ordered for Trasonic perivascular flowprobes to minimize these effects.

• Custom Normalization

"Test and Normalize Probe on Graft Material: Provide "Graft Chip" if needed. Include sample. The sample will be returned to customer with order".

A sample of the graft is required for this test. The probe will be tested in a waterbath for adequate signal and if necessary the transmit level will be increased.

• Normalization from Historical data

Normalization from Historical Data: "Normalize probe for use on _____graft same as for probe serial # _____. Include "Graft Chip".

No test on the graft is performed. This is only valid for repeat orders of same size probe and graft type. Customer should be informed to test signal & accuracy.

• Custom Calibration on Graft

Provide "Graft Chip" if needed. Sample included. Return sample to customer with order." This is a full calibration on the graft.

Note:

There are many types and sizes of vascular graft materials. The relationship of the size of graft and frequency of the probe is important so that generalized formulas cannot be used to optimize probe performance without adequate testing. Graft materials which we have some experience with are listed below. Trasonic's Manufacturing Engineer will keep graft normalization and calibration data on file.

- Dacron double velour
(improved signal with 2 x transmit)
- Dacron double woven
(improved signal with 2 x transmit)
- PTFE or Gortex:
(acute measurements difficult; improves with chronic implant)

Trasonic Recommendations

- *In situ* calibration of the probe should be performed to verify absolute accuracy
- Customers may choose to perform tests themselves. See Surgical Protocol #42 for method for treating graft material to achieve best signal.

Trasonic solicits feedback on custom normalization and calibration to validate our procedure.

Nomenclature for Special Eprom Calibration and Normalization Keys

"Superchip"

Eprom is programmed with 2 x transmit signal. This key is generally ordered for probes that are chronically implanted to boost received signal on probes that have lost signal over the duration of the implant. (It can extend the life of the implant so the researcher can continue getting data rather than terminate an experiment). Information for the programming of the key is obtained from the probe data sheet.

"Graft Chip"

This is custom normalization for perivascular probes used on some types of artificial grafts that attenuate or block the ultrasound signal. (Not all grafts require this treatment). Probes should be tested on the graft for best results. Received signal may vary from standard 1 volt normalization when used on graft with blood. Generally the transmit signal is increased.

"1/2 Gain Key" or "Half Gain Chip"

The calibration is multiplied by 0.5 for applications where the peak flow exceeds the maximum range of the flowprobe and the corresponding voltage exceeds 5 volts. Peak flow waveforms appear flattened or clipped. A 1/2 gain key may be substituted so that complete data can be collected, however, the customer must then multiply his data by 2 or change the scale factor to correctly record and scale voltage data.



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